

## **REMARKS**

Entry of the foregoing and reconsideration of the subject application are respectfully requested in light of the amendments above and the comments which follow.

As correctly noted in the Office Action Summary, claims 1-18 and 22-135 were pending with claims 1-18 and 64-135 being withdrawn. By the present response, claims 22-29, 31, 33, 43, 51-57, have been amended, claims 64-77 and 101-135 canceled and claims 136-175 have been added. Thus, upon entry of the present response, claims 1-18, 22-63, 78-100 and 136-175 remain pending (claims 22-63 and 136-175 being examined and claims 1-18 and 78-100 being withdrawn from consideration) and await further consideration on the merits.

Claims 64-77 and 101-135 directed to non-elected species are canceled without prejudice or disclaimer and reserving the right to file one or more divisional applications.

Support for the foregoing amendments can be found, for example, in at least the following locations in the original disclosure: the original claims, the drawing figures, such as FIGS. 11 and 12, and the specification, paragraphs [0020], [0062], [0064], [0065], [0066] and [0088].

## ***ELECTION/RESTRICTIONS***

The Official Action contains a Restriction Requirement. Applicants hereby confirm the election of Group II, including Claims 22-63 (drawn to a force resisting device with non-planar element) for prosecution in the above-identified application. This election is made with traverse.

It is respectfully submitted that the subject matter of at least some of the identified groups is sufficiently related that a thorough search for the subject matter of any one group would necessarily encompass a search for the subject matter of the remaining groups. For example, Group II and Group IV are sufficiently related where Group II is nonplanar and Group IV has three planes. Similarly and contrary to the Examiner's reasoning on page 3, lines 1-2, the Active Element of Group II can be used in any portion of a framed wall, just as can the Active Element of Group I.

From the above, it is respectfully submitted that the search and examination of the entire application could be performed without serious burden. MPEP §803 clearly states that "If the search and examination of an entire application can be made without serious burden, the Examiner must examine it on its merits, even though it includes claims to distinct or independent inventions" (emphasis added). It is respectfully submitted that this policy should apply in the present application in order to avoid unnecessary delay and expense to Applicants in duplicative examination by the Patent Office.

The Examiner is respectfully requested to reconsider and withdraw the Restriction Requirement and to examine at least claims 1-18, 22-63 and 78-100 in this application.

Non-elected claims 64-77 and 101-135 have been canceled from this application without prejudice or disclaimer and reserving the right to file one or more divisional applications to the subject matter therein.

Should any questions arise in connection with this application, the undersigned respectfully requests that he be contacted at the number indicated below.

***CLAIM REJECTIONS UNDER 35 U.S.C. §112***

Claims 31, 33 and 59 stand rejected under 35 U.S.C. §112, first paragraph, on the grounds set forth on 5 of the Official Action.

By the present response, Applicants have amended claims 31 and 33 in a manner which addresses the above-noted rejection. Namely, claim 31 now depends from claim 30 which provides antecedent basis for the term "v-shape" and claim 33 has been amended to reflect the first usage of the term "first dimension." With respect to the rejection of claim 59, it is noted that claim 58 recites "a v-shape" and provides antecedent basis for recitation of "the v-shape" in claim 59. Reconsideration and withdrawal of the rejection is respectfully requested.

***CLAIM REJECTIONS UNDER 35 U.S.C. §103***

Claims 22-63 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,761,001 to Mueller (hereafter "*Mueller*") on the grounds set forth on page 5 of the Official Action. For at least the reasons noted below, this rejection should be withdrawn.

**1. Declaration of the Inventors under 37 C.F.R. §1.132**

Submitted herewith is a Declaration of the Inventors under 37 C.F.R. §1.132 (hereinafter referred to as "Declaration"). The Declaration is being submitted to provide evidence that the disclosure in *Mueller* does not include disclosure of features of the presently pending claims. This evidence is presented in the areas of the claimed force versus deflection property, e.g., stiffness, forces and loads, and

mechanical and structural differences. In addition, the Declaration establishes and supports several secondary considerations which rebut the Examiner's prima facie case. Finally, the Declaration addresses the issue of criticality of the claimed properties, in response to the comments in the Official Action. Some examples are discussed below.

A. In a section III.A of the Declaration, the disclosed device in Mueller and the presently claimed Active Element are analyzed by a spring/mass/damper analysis. As shown graphically, the Mueller disclosed device exhibits load increases that are elastic in a first region and also elastic in a second region. In other words, Mueller does not disclose a plastic region nor does it disclose a force versus deflection property as that presently claimed.

The above distinction over the Mueller disclosure can be found in the claims.

For example, independent claim 22 and independent claim 43 recite that the force versus deflection property includes an elastic region and a plastic region and wherein in the plastic region deflection increases more per unit load than in the elastic region as load increases.

Further, new independent claims 170, 171, 174 and 175 recite that the claimed force versus deflection property is elastic in a first range of forces and is plastic in a second range of forces, the second range of forces greater than the first range of forces. These claims also recite that in the second range of forces, deflection increase more per unit load than in the first range of forces.

Reviewing the above, it is respectfully asserted that Applicants' Declaration shows that the factual conclusion of the Examiner, e.g., that the Mueller device and

the claims have the capability to attain a similar plastic property and a similar force versus deflection property, is not accurate. For at least this reason, the rejection should be withdrawn.

B. In section III.B of the Declaration, forces and loads in the disclosed device in Mueller and the presently claimed Active Element are analyzed and compared. In this analysis, several properties of the Active Element that flow from the claimed force versus deflection property are compared to the behavior of the Mueller device.

The analysis and discussion illustrate that the Mueller device detrimentally and disproportionately increases anchor loads as the deflection increases whereas the Active Element limits anchor loads.

Thus, in one example, structures incorporating the claimed Active Element, exhibit peaks of the cyclic force/deflection curves that remain at a relatively constant level at large deflection ranges. The analysis and discussion also illustrate that the Mueller device introduces an overturning moment whereas the claimed Active Element limits the overturning moment.

Further, in the Mueller device forces are limited to being input from the upper portion of a wall along the lateral axis and transmitted the foundation via direct attachment, whereas Applicants' Active Element directly receives shear forces on both the horizontal and vertical axis and can receive and transmit loads from multiple or distributed locations, and for example, transmitting loads directly to the foundation is not necessarily required.

Finally, the Declaration discusses that the Mueller device does not make provision for elastoplastic behavior under cyclic load – the energy is absorbed when

loaded and given back when unloaded, thereby providing no means of significant dissipation of energy, in addition to the likelihood of adversely affecting the periodicity of the building to which it is attached – while, in contrast, the Active Element has elastoplastic behavior as seen in FEA Figs. 11-13 and the WJE tests, which results in large energy dissipation.

Reviewing the above, it is respectfully asserted that Applicants have made a showing of secondary considerations adequate to rebut the Examiner's asserted prima facie case of obviousness. For example, the Declaration shows that the factual conclusion of the Examiner, e.g., the properties ascribed to the Mueller device, has been demonstrated as not accurate. For at least the above noted reason, the rejection should be withdrawn because it does not establish obviousness. See, MPEP §§2143-2143.03.

Additionally, the Declaration shows that to one of ordinary skill in the art, there is no reasonable expectation based on the disclosure in Mueller to directly or through modification attain Applicants' claimed properties. For at least this further reason, the rejection should be withdrawn because it does not establish obviousness. See, MPEP §§2143-2143.03.

Moreover, throughout the Mueller patent it is disclosed that plastic deformation is to be avoided. See, for example, col. 8, line 26 and col. 10, lines 33-34. Mueller specifically desires rigidity of the plate system, as stated many times in the specification. See, for example, col. 20, lines 41-51. As discussed in the Declaration, this is because in order for a spring to be effective in elastically storing energy (not dissipating energy), the rest of the system it is in series with must be substantially rigid so the spring element will flex as Mueller intends. Plasticity, e.g., a

form of deformation, is nearly the opposite of rigidity, e.g. does not deform during motion. By designing for rigidity, one of ordinary skill desires no plastic deformation.

Therefore and in contrast to the Examiner's assertion, the Mueller patent teaches one of ordinary skill to avoid plasticity, and the resulting strong hysteresis and energy dissipation, and actually teaches away from the claimed Active Element.

The above noted distinctions can be found in the claims. For example, independent claims 22 and 43 and new independent claims 170 and 171 recite that the force versus deflection property includes an elastic region and a plastic region. However, the Mueller patent teaches away from a force versus deflection property that includes plastic deformation.

Finally, the elastoplastic nature of Applicants' Active Element, whereby it behaves elastically under a first loading, and plastically (desirable deformation) under a second and higher loading, and in some embodiments, a second elastic manner under a third and higher loading, is discussed in the application and demonstrated in the FEA's illustrated in Applicants' Figures 12-14 and the hysteresis loops of the WJE report (Appendix C). There is no single element, or combination or sum of elements in the Mueller device that will produce the claimed cyclic elastoplastic properties of Applicants' Active Element. (See SAE reference, Appendix B).

For at least this additional reason, the rejection should be withdrawn because it does not establish obviousness. See, MPEP §§2143-2143.03.

C. In section V. of the Declaration, the mechanical and structural distinctions between the Mueller device and the claimed Active Element are discussed. Such

noted features include, for example, the Active Element being a “distributive load” system formed of a sheet of material, e.g. a sheet of metal (claims 22, 43, 170 and 171), in contrast to the Mueller device being a “collective load” system comprising a collection of springs and rigid metal structures. For at least this additional reason, the rejection should be withdrawn because it does not establish obviousness. See, MPEP §§2143-2143.03.

D. In another example, the Declaration and Application show that even if there are shared properties, there is factual evidence of unexpected or superior properties, e.g., the claimed Active Element has superior force versus deflection property in the plastic region, properties that can match the general characteristics of a standard code shear wall while greatly improving the energy dissipation, and other advantages. See, Sections III.A-B, IV. and Appendices C and G of the Declaration and Figure 10 of the Application.

For at least the above noted reason, the rejection should be withdrawn because it does not establish obviousness. See, MPEP §§2143-2143.03.

E. Finally, the Declaration indicates that Applicants' Active Element resolves a long felt need in the art for a known problem. Here and as represented by Appendices D-F, the long felt need is solutions to stress concentrations caused by discontinuous structural elements, e.g., allowing walls of any length with any number of openings to have generally uniform load carrying, resulting in reduced localized stress concentrations, thereby providing unexpected performance improvements leading to less damage for a given earthquake or hurricane level and forestalled



collapse at higher loads (see, e.g., Sections III. – IV. and Appendices D-F).

Applicants' Active Element addresses and alleviates this problem, as can be seen by the properties "restored" to discontinuous structural elements incorporating the Active Element (see, for example, Figure 10 of the Application).

From the above, it is respectfully asserted that Applicants have made a showing of secondary considerations, e.g., addressing a long felt and heretofor unaddressed need, adequate to rebut the Examiner's asserted prima facie case of obviousness. For at least the above noted reason, the rejection should be withdrawn because it does not establish obviousness. See, MPEP §§2143-2143.03.

**2. Examiner's interpretation of language in the Mueller patent and claims is based on Mueller's incorrect usage of terminology, and is therefore also incorrect: if interpreted correctly, the Mueller patent does not render the present claims obvious**

The attached Declaration notes and discusses several instances where the Mueller patent uses technical language in other than its generally accepted meaning (see, for example, Page 3 and section III. and Appendix A of the Declaration).

For example, in the Abstract and elsewhere, *Mueller* describes that springs "dissipate" energy. This is not consistent with generally accepted knowledge of one skilled in the art. In fact, a spring temporarily absorbs energy when deflected, and then releases it when the forces causing the spring to deflect are released – this is not dissipation. (See Appendix B.). Therefore, the description of springs dissipating energy is not correct.

The reliance by the Examiner on the express language in the *Mueller* patent is misplaced because the language as used by *Mueller* does not have the meaning upon which the Examiner relies for the rejection. For at least this reason, it is respectfully submitted that the rejection is improper and should be withdrawn.

### **3. Additional Claim Distinctions**

In addition to the above differences, Applicants' present claims provide numerous recited structural features that are not present in the Mueller disclosure, either explicitly or implicitly.

For example, claim 22 and claim 43 recite that the at least one Active Element includes a sheet of metal having a non-planar region. In contrast, the Mueller device is a collection of springs, an interconnected panel or A-frame assembly and metal box structures, none of which is a sheet of metal that operates beneficially within elastic and plastic ranges. Further, the sheets of metal in the Mueller device are planar, not with a non-planar region as claimed. In other examples, the claimed Active Element has a v-shape (claims 30, 34, 44 and 58), is non-symmetric (claims 31, 35, 45 and 59) and/or has a truncated v-shape (claims 147 and 154) while the Mueller device has not been shown to have either of these features. In a further example, the claimed Active Element has a specific order of planar and non-planar features in a first direction (claims 33 and 43). In still other examples, the claimed Active Element has a specific parallel relationship of two or more non-planar regions (claims 136, 142, 149 and 156) has apertures disposed through the sheet of metal adjacent the active element (claims 137, 144, 148, 150 and 158) and is a single component formed by the sheet metal (claims 139, 146, 152 and 160).

Based on at least the above noted features, the rejections of Applicants' claims as outlined in the Official Action are improper as an obviousness rejection because the rejections has failed to establish a *prima facie* case of obviousness. Here, the cited reference does not disclose, teach or suggest all of the claim limitations. See, M.P.E.P. §§2143-2143.03. Accordingly, the rejection is improper and should be withdrawn.

In another example, claim 33 and claim 43 explicitly relate that co-planar or parallel portions, the non-planar region between the co-planar or parallel portions, are fixed to two different structural elements. In claims 35, 44, and 58, the non-planar region has a v-shape. *Mueller* is simply lacking a structure that has such an arrangement. First, there is no non-planar region between co-planar or parallel portions within the meaning of the claims. Second, even if one considers the entire *Mueller* unit shown in, for example, Fig. 1B, as having a v-shape, then there is no portion corresponding to the co-planar or parallel portions because the legs of the A frame-shape 120 are oriented at an angle, and furthermore the legs are attached to the same structural elements, not different structural elements.

Based on at least the above noted features, the rejections of Applicants' claims as outlined in the Official Action are improper as an obviousness rejection because the rejections has failed to establish a *prima facie* case of obviousness. Here, the cited reference does not disclose, teach or suggest all of the claim limitations. See, M.P.E.P. §§2143-2143.03. Accordingly, the rejection is improper and should be withdrawn.

Moreover, when analyzed for load, the "V" piece cited by the Examiner is only attached to one "side" of the load path and not attached to the other. For example,

the Examiner identified active element 960 is shown in Fig. 8 and discussed in column 22. The Examiner identified active element 960 is actually designed not to flex. In column 22, lines 20-27, *Mueller* discloses that the reinforcing plate 955a distributes compressive forces "so as to inhibit deformation of the end casing." The reinforcing plate is made of 1/2" thick steel plate with dimensions of approximately 3 1/8" x 2". Note that the hole in 960 and 961 is specified as being 13/16" (lines 14) and the bolt and nut is specified as 3/4" (lines 41). Therefore, the bolt is 1/16" LESS than the diameter of the hole and is free to slide and rotate relative to the motion of the bolt. In addition, examination of the drawing in Fig. 8 and description beginning in Col 22, line 44, shows that the spring is only loaded in compression, therefore the features in *Mueller* proposed to be relied upon by the Examiner in the rejection does not have the ability to reverse cyclic load in compression and tension. Moreover, it is not clear what features in *Mueller* can be realistically relied upon by the Examiner for such cyclic loading when the bolt size and load path in *Mueller* are considered.

#### **4. The Rejection Relies Upon Unsupported Inherency**

Finally, to the extent that all of the claimed features in the present application are not disclosed explicitly in *Mueller*, the Examiner must be relying upon an inherent disclosure in *Mueller*. However, such reliance is misplaced.

In order for a claimed element to be "inherent" in a prior art reference, the claimed element or feature must necessarily result from the prior art. "Such evidence must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill." and "Inherency, however, may not be established by

probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient." Continental Can Co., U.S.A. v. Monsanto Co., 20 U.S.P.Q.2d 1746, 1749 (Fed. Cir. 1991), See, In re Rijckaert, 28 U.S.P.Q.2d 1955, 1957 (Fed. Cir. 1993). ("The mere fact that a certain thing may result from a given set of circumstances is not sufficient to establish inherency.").

In other words, for the claimed features to be inherent in *Mueller*, every device that could be used in the *Mueller* reference must have the claimed features. However, as shown in the accompanying declaration, at least some aspects of the Mueller device differ from the presently claimed device, e.g., stiffness, forces and loads and mechanical and structural difference. Thus, the reliance upon any inherent features in Mueller is improper because it has been shown that at least some features in Mueller differ from the claimed device and are therefore, in fact, not inherent. For at least this further reason, the rejection is improper and should be withdrawn.

## **5. Dependent Claims**

The remaining claims not discussed above depend directly or indirectly from the independent claims and therefore distinguish over the cited reference for at least the same reasons as outlined above.

## **NEW CLAIMS**

Applicants have added new claims 136-175. Support for the new claims can be found in, for example, the original claims, the drawing figures, such as FIGS. 11 and 12, and the specification, paragraphs [0020], [0062], [0064]-[0066] and [0088].

With respect to claims 164-169, Applicants direct the Examiner's attention to Figure 7 vs. Figure 10. As seen in those figures, the transverse deformation of the Active Element will compress the top of the left hand Active Element and expand the bottom (opposite on the Active Element on the right side). In addition, the narrow edge segment is rotated relative to the upper and lower panels. This rotation is resisted by the Active Element's in Fig. 10, such that the narrow edge portions no longer rotate relative to the upper and lower sections, and are displaced the same as the following panel. In this way the properties of the panel are restored toward that of the unperforated panel, as discussed in other portions of the application. Also and with respect to new independent claims 172-175, these claims recite that the active element includes a sheet formed from an engineered plastic or an engineered composite material incorporating the mechanism of plasticity. No such material is used in the Mueller device.

Examination of the new claims is respectfully requested.

**CONCLUSION**

From the foregoing, further and favorable action in the form of a Notice of Allowance is earnestly solicited. Should the Examiner feel that any issues remain, it is requested that the undersigned be contacted so that any such issues may be adequately addressed and prosecution of the instant application expedited.

Respectfully submitted,

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